

what import this coincidence may be, whether Nothnagel by his gentle pressure suspended the functional activity of the same set of fibres that Tschirjew stilled by his light lifting, I am not prepared to say. I would merely have the fact borne in mind. Yet, when I recall the quick suspension of the tendon-reflex by minute causes, I am disposed to believe that the fibres in the two cases were identical; and herein may be a possible clue to the comprehension of those finely tremulous, rhythmical movements which we daily witness in paralysis agitans and disseminated sclerosis, and which serve to distinguish them so strongly from the quickly jerky movements of wider range in chorea. It is among the possibilities, too, that the symptoms of locomotor ataxia and spasmodic spinal paralysis may be better elucidated than they are at present by a further study of these nerves.

ART. VI.—CASE OF INFANTILE ENCEPHALITIS,
FOLLOWED BY ATHETOTIC SYMPTOMS.

BY EDWARD C. SPITZKA, M. D., NEW YORK.

TOWARDS the latter end of February last a young man presented himself to me for treatment, at the North-Eastern Dispensary, who exhibited a group of symptoms which, in their aggregate, I am disposed to class under Hammond's "Athetosis." It was first noticed, on examination, that there was considerable bodily asymmetry, the entire right side of the cranium and face, as well as the right arm and right leg, being noticeably smaller than the corresponding parts upon the opposite side. This asymmetry was most marked in the face and cranium; less so in the arms, and least of all in the legs; the muscles of the atrophic side were contracted and firm, and the right side of the face was drawn, its features being sharp, contrasting in this respect with the plump left side. The next peculiarity noticed was a con-

strained position of the right limbs: the arm was extended in a horizontal line behind the patient, and at the same time twisted outwards, while the leg was thrown forward, the foot inverted and adducted; the knee was flexed and somewhat in the position of a genu valgum; from the patient's expression of countenance—and this was confirmed by his subsequent admission as correct—I was led to believe that he did not exert his will to maintain the limbs in their abnormal position.

On now seizing his arm, "untwisting" it, bringing it out horizontally, and letting it go, the member was agitated by violent spasms, which involved the muscles of the fingers, hand and forearm individually. These movements, after several pendulum-like oscillations, which gradually increased in intensity, culminated in the arm being violently struck against the hip, where, after several tentative efforts, it remained fixed. If the arm was drawn away from its support, it again became agitated, and, if it happened to strike behind the hip, it was violently drawn back in its original constrained position. During all this time the patient felt worried, and stated that he did not feel fully at ease unless his arm was thrown out behind him, in the manner above indicated.

In walking he habitually carries it in this position, attracting the notice of all passers-by; while he can walk many miles without fatigue, he has to halt every ten or twenty steps to "recover his feet;" that is, with each successive step there is a more pronounced inclination for his toes to become flexed under the foot, and this tendency extending finally to the foot, as a whole, forces him to halt until the flexing tendency subsides, which it does in from twenty to sixty seconds.

Thus far I have described only the coarser disturbances of motility and position; these were combined with other more delicate anomalies. Unless the arm was fixed in one of the two positions in which I stated it to be comparatively quiescent, the individual fingers, independently of each other, executed movements which I can compare to nothing so well as those described by Dr. Wm. A. Hammond and others under the name of athetosis. In the course of these movements the hand frequently assumed positions exactly like

those represented in the wood-cuts in the former author's work.

An additional peculiarity noticed was, that while usually the hand was flexed in the wrist and the fingers extended as a whole, as soon as the latter were forcibly flexed, the hand became violently extended, and as soon as it had reached the limit of extension, the forearm underwent an equally involuntary supination and flexion. If now, on the other hand, I flexed the extended hand, the fingers once more became extended and separated; or, if I extended instead the fingers, the hand became flexed. The transition was accompanied by athetotic movements.

When the patient's foot was liberated from the restraining influence of the shoe and stocking, his toes were seen to undergo athetoid movements also, but with much more regularity of rhythm and constancy than the fingers. There was also a similar relation between the relative position of the toes and of the foot, as a whole, as that just described in the case of the hand.

All the detailed symptoms formed a constant part of the patient's condition, and could be evoked at all times; besides this there were paroxysmal symptoms of two kinds. The first kind consisted of spontaneous exacerbations of the clonic spasms, known as athetotic; these involved the muscles of the face, fingers, toes, hand, foot, arm and leg of the right side, and ceased after having lasted an hour or even a whole afternoon. Mental excitement or motor over-exertion seemed to bring them on; he had never had them at night, to his knowledge, unless frightened out of his sleep.

The second kind consisted of attacks of vertigo, during which the patient claims to be conscious of what is going on around him. He states that he has these attacks only in the summer season and when exposed to the sun. Subsequent developments showed that he has them in winter and independently of caloric influences as well. He also occasionally has photopsia of a remarkable character.

The lobules of both of his ears are congenitally defective; none of his brothers or sisters have this deformity. There is stricture of the ductus ad nasum on the affected side, probably

related to the asymmetry of the skull. He complains of paroxysmal pains in the left mammary region.

His mental condition is fair, considering the circumstances of a necessarily defective education, and although his memory is not very accurate, he seems to possess a considerable share of good sense, abstaining from alcoholic liquors because he has seen its bad influence upon members of his family. He has taught himself to write with his left hand, though clumsily.

As Doctor J. G. Kiernan, of this city, had been kind enough to refer this interesting case to me, and as the patient himself was unable to give me all the history I desired, I asked my correspondent to inquire as to the family and personal history of the patient, members of whose family were under the Doctor's charge. I received the following reply:

* * * * "The hereditary history is unfavorable on both sides, especially on the maternal side. The maternal great-grandfather, great-granduncle, grandfather and two uncles died in apoplectic attacks; on the paternal side the relatives have been long-lived, but the father himself was very intemperate for many years before, and at the time of the patient's birth. The patient is one of twelve children, three of whom were still-born, one died a day after birth, and five are still living. Of the latter, a sister is subject to vertigo, accompanied by a hissing sound in the right ear. Although I have not examined her myself, I should judge from the fact that these attacks have a connection with the menstrual periods, and that it has been found necessary to remove her from school on their account, that she is epileptic.

"The patient I sent you, M. H., is twenty-two years old, Scotch descent, and is stated to have been perfectly healthy and intelligent up to his fifth year, when he passed through an attack of scarlatina. While convalescing he was one day standing in conversation with his sister, when he suddenly fell down unconscious, after uttering a loud scream. His consciousness returned after about one hour, and projectile vomiting now came on, which lasted until noon of the following day. I say projectile, because it was graphically described by the mother and older sister in such a way as to leave no doubts in my mind.

"When the vomiting ceased, it was discovered that the patient was paralyzed on one side of his body (the right) and unable to walk. After several months he gradually began to regain power on the paralyzed side, and except for the peculiar (athetotic) movements which subsequently developed, he seems to have regained motion nearly entirely.

"I cannot find out how long ago the movements you speak of first commenced; it seems that for many years he was entirely free from them; that they developed slowly and gradually, and that they attained their present degree of development about three years ago. The attacks of vertigo I have myself witnessed this winter, and the patient presents a stupid appearance after the attack is over, so that I consider an epileptic nature not out of the range of possibilities. While his general mental condition is good, his relatives state that he is fond of relating imaginary occurrences. His memory is defective; he is a poor arithmetician, and has the tastes and disposition of a boy of fourteen. I do not believe that there is the slightest ground for suspecting any specific disease in the family."

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From this I have seen reason to designate the case as one of infantile encephalitis (Griesinger), followed by contractures and athetosis. When exhibiting the patient before the Neurological Society I asked Dr. E. C. Seguin, the only one present at the meeting who had seen Hammond's original case,* how far M. H. resembled the latter. He stated that in several respects the movements seemed to be different, and further, that he had several times himself observed symptoms following hemiplegia in children which, because they were similar to, but not identical with those manifested in Dr. Hammond's patients, he designated as athetoid. Since the term athetosis is only employed to designate a complex of symptoms, and since, moreover, the total number of cases presenting it is a small one, I should be loth to choose between two terms here, especially as a perusal of various cases scattered in the literature of the subject shows that there are many variations from the typical picture as presented by the first cases described.

*Shown at the first session of the American Neurological Association, and not seen by the writer.

In addition to the slow clonic spasms, my patient exhibited the detailed interesting anomaly in the position of his limbs. Although not exactly like the peculiar constrained posture of epileptic imbeciles described by Meynert, and of a case of multiple syphiloma of the brain referred to by myself in this journal, yet it seems to be analogous as far as it goes, and I should attribute it to a similar lesion, namely, a sclerotic cicatrix or cicatrices in and about the thalamus and crus, regions whose injury in animals will produce corresponding anomalies of limb position. It is known that the athetotic symptoms themselves are more frequently found associated with lesion of the thalamus than of any other part of the encephalon (Gowers, Charcot, and others), and we may well suppose that in the present instance one extensive lesion, the residue of the post-scarlatinal encephalitis involving this region, is the cause both of the contractures and of the athetosis.

The patient's heart is very irritable, but neither colleagues who examined that organ nor myself could detect any unnatural sound.

Although he has been under my care for only a month, yet I think there is some improvement in his condition, especially in the coarser movements, which are less excursive and spasmodic than they have been. The athetoid movements themselves seem more intractable. My treatment consists in advising the patient to exercise the arm first with weight, and then to exercise his will-power *gradatim* on the affected muscles. In this latter respect he has made some progress. Ergot and conium are given on other indications to the same patient.

Nothing can be clearer than the difference between the clonic spasms exhibited by this patient and the post-hemiplegic chorea, with which some are attempting to confound athetosis. While convinced with Dr. E. C. Seguin that my case is not identical with those described by the discoverer of athetosis, I have ranged it under this head because otherwise it would be necessary to erect an entirely new symptom group for the reception of this single case.

I have seen two other and more typical cases of athetosis in patients suffering from paralytic insanity. It was discovered in them about three years ago by Dr. J. G. Kiernan, then of

the City Asylum, and although the discovery was published without specified acknowledgment, and, in general language, by an asylum physician who made use of Dr. Kiernan's notes in the compilation of his paper, I think that the priority of discovery of this hitherto unknown complication of paresis belongs to Dr. Kiernan, who will shortly publish the details of his two cases in full.

ART. VII.—RESEARCHES ON THE SPINAL CORD.

BY ISAAC OTT, M. D.

THE spinal cord, besides being a conductor to and fro of nervous impulses, is also the seat of several nerve centres, administering to the functions mainly automatic. I shall consider in this paper only the practical bearing of certain points connected with the physiology of the spinal cord. These points have been worked out in the laboratory at Johns Hopkins University, and will be published in detail elsewhere.

SECRETORY FUNCTIONS.

That the spinal cord and medulla oblongata preside over the secretion of sweat has been shown by the researches of Luchsinger. These centres send out fibres in the cat through the anterior root of the fourth dorsal nerve, into the stellate ganglion, and then into the ulnar and median nerves to the skin of the anterior extremities. The sweat fibres for the posterior extremities run through the anterior root of the three last dorsal nerves into the abdominal sympathetic, and then into the sciatic. The anterior roots of the last lumbar and first sacral also send fibres into the sciatics. On the sweat glands are seated ganglia inhibiting the activity of the sweat secretion, and these ganglia are called into exaggerated activity by irritation of the fibres contained in the abdominal sympathetic. These inhibitory ganglia may serve to explain the phenomenon of a "hot non-sweating skin." Heat, ordinarily, is one of the greatest excitants of the sweat secretion, and ought to start the secretion in feverish states, unless there is some force